EC2

1. **What is AWS EC2?**
   1. AWS EC2 (Elastic Compute Cloud) is a web service that provides resizable compute capacity in the cloud. It allows users to run **virtual machines (instances) on demand.**
2. **How do you launch an EC2 instance?**
   1. You can launch an EC2 instance using the AWS Management Console, AWS CLI, AWS SDKs, or AWS CloudFormation templates.
3. **What is an Amazon Machine Image (AMI)?** 
   1. An AMI is a **pre-configured template used to create EC2 instances.** It contains the necessary information to launch an instance, including the operating system and application server.
4. **Can you change the instance type of a running EC2 instance?**
   1. No, you cannot change the instance type of a running instance. However, you can stop the instance, change its type, and then start it again.
5. **What is the significance of an Amazon EBS volume in EC2?**
   1. An Amazon EBS (Elastic Block Store) volume provides persistent block-level storage for EC2 instances. It can be attached to an instance and persists even if the instance is stopped.
6. **Explain the difference between instance store and EBS-backed instances.**
   1. Instance store is **temporary storage** that is directly attached to the physical host of the instance. EBS-backed instances use Amazon EBS volumes for storage, providing persistent data.
7. **What is the purpose of Security Groups in EC2?**
   1. Security Groups act as **virtual firewalls for EC2 instances.** They control inbound and outbound traffic based on rules defined for each group.
8. **How do you connect to an EC2 instance?**
   1. You can connect to an EC2 instance using SSH (for Linux instances) or RDP (for Windows instances) through the associated key pair or password.
9. **What is an EC2 key pair, and why is it necessary?**
   1. A key pair is a set of security credentials used to connect to an EC2 instance. It consists of a public key (stored on the instance) and a private key (kept secure by the user).
10. **Explain the concept of an EC2 instance type.**
    1. Instance types define the hardware of the host computer used for the instance and determine the instance's CPU, memory, and storage capacity.
11. **What is an EC2 Reserved Instance?**
    1. A Reserved Instance is a billing discount offering significant savings compared to On-Demand pricing. Users **commit to a one- or three-year term** in exchange for lower hourly rates.
12. **What is an EC2 Auto Scaling Group?**
    1. An Auto Scaling Group automatically adjusts the number of instances in response to changes in demand or based on a defined schedule.
13. **How does Elastic Load Balancing (ELB) work with EC2 instances?**
    1. ELB distributes incoming application **traffic across multiple EC2** instances to ensure no single instance is overwhelmed. It enhances the availability and fault tolerance of your application.
14. **What is the purpose of user data in EC2 instances?**
    1. User data allows you to configure an EC2 instance **during launch by providing a script** or instructions. This can include installing software, configuring settings, etc.
15. **Can you attach multiple EBS volumes to a single EC2 instance?**
    1. Yes, you can attach multiple EBS volumes to a single EC2 instance, and each volume operates independently.
16. **What is an EC2 Placement Group?**
    1. A Placement Group is a logical grouping of instances within a single Availability Zone. It enables low-latency communication between instances.
17. **Explain the difference between On-Demand Instances, Reserved Instances, and Spot Instances.**
    1. On-Demand Instances are pay-as-you-go with no upfront commitment. Reserved Instances offer a discount for a one- or three-year commitment. Spot Instances are bid-based and can be terminated if the spot price exceeds your bid.
18. **What is the purpose of an EC2 tag?**
    1. Tags are key-value pairs attached to EC2 instances for better organization and resource management. They can be used for cost allocation, automation, and identification.
19. **How can you secure data at rest on an EBS volume?**
    1. You can enable EBS volume encryption, which uses AWS Key Management Service (KMS) to encrypt data at rest.
20. **What is the significance of an EC2 AMI copy?**
    1. AMI copy allows you to copy an AMI from one region to another, making it available in different regions.
21. **How can you monitor EC2 instances?**
    1. AWS CloudWatch provides monitoring for EC2 instances, offering metrics on CPU usage, network activity, disk I/O, and more.
22. **How do you troubleshoot connectivity issues to an EC2 instance?**
    1. Check the security group rules, ensure the instance is running, and verify network ACLs. Also, examine logs and verify key pair settings.
23. **What is Amazon EC2 Dedicated Host?**
    1. A Dedicated Host is a physical server with EC2 instance capacity dedicated to a specific account, offering greater control over instance placement.
24. **How do you scale EC2 instances horizontally and vertically?**
    1. Horizontal scaling involves adding more instances, while vertical scaling involves increasing the resources (CPU, RAM) of a single instance.
25. **What is the role of an EC2 Spot Fleet?**
    1. An EC2 Spot Fleet is a collection of Spot Instances and, optionally, On-Demand Instances. It provides flexibility in obtaining compute capacity at a lower cost.
26. **What is the difference between an Elastic IP (EIP) and a public IP in EC2?**
    1. EIPs are static IP addresses that can be associated with an EC2 instance, while public IPs are dynamic and may change if the instance is stopped and started.
27. **How do you automate the launch of EC2 instances?**
    1. You can use AWS services like AWS Lambda, AWS Auto Scaling, and tools like AWS CloudFormation for automation.
28. **Explain the concept of EC2 instance metadata.**
    1. EC2 instance metadata provides information about an instance, such as instance type, IP addresses, security group settings, and more. It's accessible within the instance.
29. **Can you move an EC2 instance from one VPC to another?**
    1. No, you cannot move an EC2 instance directly between VPCs. You would need to create an Amazon Machine Image (AMI) and then launch the instance in the new VPC.
30. **What is the use of an EC2 Network Interface (ENI)?**
    1. An ENI is a virtual network interface that can be attached to an EC2 instance. It allows for multiple IP addresses, elastic network interfaces, and network performance optimization.
31. **How do you optimize the performance of EBS volumes?**
    1. Use Provisioned IOPS for high-performance workloads, monitor and adjust based on workload characteristics, and choose appropriate instance types.
32. **How do you enable instance recovery for an EC2 instance?**
    1. Instance recovery can be enabled in the EC2 Auto Scaling group settings. It automatically recovers instances that fail system status checks.
33. **What is an EC2 Image Builder?**
    1. EC2 Image Builder is a service that simplifies the creation, maintenance, and deployment of Amazon Machine Images (AMIs).
34. **Can you share an Amazon EBS snapshot with another AWS account?**
    1. Yes, you can share an EBS snapshot with other AWS accounts by modifying its permissions.
35. **How do you manage instance termination protection in EC2?**
    1. You can enable termination protection for EC2 instances to prevent accidental termination. It can be configured during instance launch or modified later.
36. **What is the AWS Nitro System in relation to EC2 instances?**
    1. The AWS Nitro System is a combination of hardware and software components that power the latest generation of EC2 instances, providing improved performance, security, and innovation.